

Attorney Docket #: P132-US

IN THE SPECIFICATION

1. Please amend the title as follows.

~~A METHOD AND APPARATUS FOR LUBRICATING MICROELECTROMECHANICAL DEVICES IN PACKAGES~~ PACKAGED MICROELECTROMECHANICAL DEVICE WITH LUBRICANT

2. Please amend paragraph [0016] as follows.

[0016] The present invention provides a method and apparatus for lubricating surfaces of microelectromechanical devices package by placing a container having selected lubricant in the package in which the microelectromechanical device is disposed. The lubricant evaporates from an opening of the container and contacts the surfaces to be lubricated. When the amount of the lubricant is in the micro liter order and needs to be precisely controlled, the container can be a capillary tubing with an interior volume generally equal to the desired amount. The capillary tubing is placed on the package substrate on which the microelectromechanical device is disposed. The lubricant inside the capillary tubing evaporates from an opening of the tubing and contacts the target surfaces. The container having the lubricant can be placed on the package substrate before sealing the package.

3. Please amend paragraph [0017] as follows.

[0017] The container may also be placed within the microelectromechanical device if the container has a compatible dimension. The lubricant can be mixed with a selected diluent for improving the precise control of the amount of the lubricant and meanwhile, expedite expediting the transportation of the lubricant from inside the container to the target surfaces.

4. Please amend paragraph [0018] as follows.

[0018] Turning to the drawings, FIG. 1 illustrates a perspective view of an exemplary microelectromechanical device package. Microelectromechanical device package 100 comprises microelectromechanical device 108 attached to package substrate 102. The package substrate may take any desired shapes and forms; shape and form and may comprise any suitable materials material. In this particular example, the package substrate is a ceramic and has a cavity in which the microelectro-mechanical microelectromechanical device can be disposed. Lubricant container 110 is placed on the package substrate at a location proximate to the

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microelectromechanical device as shown in the figure. The container contains a lubricant that evaporates from the container to the surface of the microelectromechanical device for lubricating the surface. In order to seal the package, package cover 104 is provided and sealing material 106 is disposed between the package substrate and the package cover for bonding the package substrate and the package cover. The sealing material can be deposited on the top surface of the package substrate or on the bottom surface of the package cover, or alternatively, on both.

5. Please amend paragraph [0020] as follows.

[0020] The micromirrors of the micromirror array may take any desired shapes shape and configurations. An exemplary micromirror of the micromirror array is illustrated in FIG. 3. Referring to FIG. 3, the micromirror comprises hinge 126 that is held by two posts 124 on the glass substrate 116. A reflective mirror plate 122 is attached to the hinge such that the mirror plate is operable to rotate relative to the glass substrate in response to the electrostatic field established between the mirror plate and the electrode (not shown) associated with the mirror plate. In this particular example, the mirror plate is attached to the hinge such that the mirror plate can rotate asymmetrically—that is the mirror plate can rotate to a larger angle in one direction than in the opposite direction. This asymmetric rotation is achieved by attaching the mirror plate to the hinge such that the attachment point is neither along a diagonal of the mirror plate nor at the center of the mirror plate. Moreover, the hinge is disposed such that the hinge is parallel to but offset from a diagonal of the mirror plate when viewed from the top. In fact, other configurations can be employed. For example, the mirror plate can be any other desired shape. The hinge and the mirror plate can be arranged such that the mirror plate rotates symmetrically in both directions.

6. Please amend paragraph [0031] as follows.

[0031] The container having the lubricant (or lubricant with diluent) can be disposed in a variety of microelectromechanical device packages. Another exemplary microelectromechanical device microelectro-mechanical package is illustrated in FIG. 5. Referring to FIG. 5, package substrate 128 is a flat substrate. Microelectromechanical device 108 is attached to the package substrate. Container 110 having the lubricant (or a mixture of the lubricant and a diluent) is place close to the microelectromechanical device on substrate 128. Spacer 130 is disposed on the flat substrate 128 so as to form a cavity for accommodating the microelectromechanical device. Package cover

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132 is placed on the spacer and the package substrate. The spacer and the package substrate can be bonded and hermetically sealed using proper sealing material and so as the spacer and the package cover.